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CLAIMS

1. A switching network for switching frames of data, in defined time-slots, of a cross-connection request between a desired input and a desired output, comprising an input stage consisting of a plurality of switching matrices, an intermediate stage consisting of a plurality of switching matrices, and an output stage consisting of a plurality of switching matrices, each input stage switching matrix having a link to each intermediate stage switching matrix and each intermediate stage switching matrix having a link to each output stage switching matrix, including means for routing each time-slot of each frame independently through the switching matrices.

2. A switching network as claimed in claim 1, in which the routing means is arranged to route each succeeding time-slot of the cross-connection request frame through the intermediate stage switching matrix having the link with the largest instantaneous number of free time-slots.

3. A switching network as claimed in claim 2, in which the links are between the intermediate stage switching matrix and the output stage switching matrix of the requested output.

4. A switching matrix as claimed in claim 3, in which the routing means is arranged to route each succeeding time-slot through the intermediate stage switching matrix having the link from the input stage switching matrix at which the request was received with the largest instantaneous number of free time-slots, in the event that a plurality of

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intermediate stage switching matrices have equal instantaneous numbers of free time-slots in the links to the output stage switching matrices.

5. A switching matrix as claimed in any one of claims 1 to 4, in which the routing means is arranged to create a list of free time-slots in the links between the intermediate stage switching matrices and the input and output stage switching matrices of the request when a cross-connection request is received.

6. A switching matrix as claimed in any one of claims 1 to 5, in which the links are time division multiplex links.

7. A switching matrix as claimed in any one of claims 1 to 6, in which the number of intermediate stage switching matrices is at least two less than the sum of the number of inputs of each input stage switching matrix and outputs of each output stage switching matrix.

8. A switching matrix as claimed in any one of claims 1 to 6, in which the number of intermediate stage switching matrices is less than twice the number of inputs of each input stage switching matrix.

9. A switching matrix as claimed in claim 8, in which the number of intermediate stage switching matrices is less than one and one half times the number of inputs of each input stage switching matrix.

10. A switching matrix as claimed in any one of claims 1 to 9, in which the routing

means is arranged to re-assemble the individually-routed time-slots into frames at the

output of the output stage switching means.

11. A switching matrix as claimed in any one of claims 1 to 10, in which the switching

means is adapted to receive standard data traffic from which internally-generated frames

replacing at least some overhead have been created.

12. A switching matrix as claimed in any one of claims 1 to 11, in which each time-slot

of the links corresponds to a frame having a data rate at least one sixteenth of that of the

links.

13. A switching matrix as claimed in claim 12, in which the time-slots can each

accommodate an AU-3 frame of the SDH standard.

14. A digital cross-connect, including a switching matrix as claimed in any one of

claims 1 to 13.

15. A method of routing frames of data in defined time-slots through a switching

network to fulfil a cross-connection request between a desired input and a desired

output, wherein the switching network comprises an input stage consisting of a plurality

of switching matrices, an intermediate stage consisting of a plurality of switching

matrices, and an output stage consisting of a plurality of switching matrices, each input

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stage switching matrix having a link to each intermediate stage switching matrix and

each intermediate stage switching matrix having a link to each output stage switching

matrix, the method including the step of routing each time-slot of each frame

independently through the switching matrices.

16. A method as claimed in claim 15, in which each succeeding time-slot of the cross-

connection request frame is routed through the intermediate stage switching matrix

having the link with the largest instantaneous number of free time-slots.

17. A method as claimed in claim 16, in which the links are between the intermediate

stage switching matrix and the output stage switching matrix of the requested output.

18. A method as claimed in claim 17, in which each succeeding time-slot is routed

through the intermediate stage switching matrix having the link from the input stage

switching matrix at which the request was received with the largest instantaneous

number of free time-slots, in the event that a plurality of intermediate stage switching

matrices have equal instantaneous numbers of free time-slots in the links to the output

stage switching matrices.

19. A method as claimed in any one of claims 15 to 18, in which there is created a list of

free time-slots in the links between the intermediate stage switching matrices and the

input and output stage switching matrices of the request when a cross-connection

request is received